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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,305	10/17/2001	Hidetoshi Ohnuma	S01P1510US00	7853

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EXAMINER

MOHAMEDULLA, SALEHA R

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,305

Applicant(s)

OHNUMA, HIDETOSHI

Examiner

Saleha R. Mohamedulla

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 1-6 are pending.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 6 recites the limitation "said parameter settings" in line 2. There is insufficient antecedent basis for this limitation in the claim. Correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by US# 5,707,765 to Chen.

Chen teaches a photolithography mask and method of making the same. The mask utilizes serifs to increase the correspondence between an actual circuit design and the final circuit pattern on a semiconductor wafer. The mask uses a plurality of serifs having a size

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determined by a resolution limit of the optical exposure tool used during the fabrication process. The serifs are positioned on the corner regions of the mask such that a portion of surface area for each of the serifs overlaps the corner regions of the mask. The size of the serifs is about one-third the resolution limit of said optical exposure tool (Abstract). Because Chen teaches transferring circuitry patterns to silicon wafers to integrated circuits, Chen teaches an etching and photolithographic process (col. 1, lines 14-26). Therefore, Chen teaches mask correction units, that is serifs, which are established based on a space dependency of a pattern obtained by photolithographic and etching processes, because the serifs have a size determined by the resolution of an optical exposure tool. Chen also teaches that design data for the mask is corrected based on the mask correction units.

Chen also teaches claims 3 and 4 because these claims are product by process claims. The claims are only limited by the structural features recited in the claims. The only structural feature recited is a photomask. Chen teaches a photomask and therefore, teaches claims 3 and 4.

Chen also teaches using an exposure tool having a specified numerical aperture to perform a photolithographic process on a photoresist (col. 6, lines 20-40). The exposure tool had a mercury I-line wavelength. Therefore, Chen teaches the limitations of claim 5.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.


7. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US# 5,707,765 to Chen in view of US# 5,895,736 to Nakajima.
8. Chen teaches the limitations of claims 1 and 3 as discussed above. Chen does not teach that parameter settings for lithographic equipment are corrected according to the XY differential based on a space dependency. Nakajima teaches a method of forming a pattern in a target area by radiating an electron beam from an electron beam gun through a rectangular aperture formed in a first aperture plate, allowing the electron beam to fall onto one of aperture patterns formed in a second aperture plate, an edge portion of the second aperture plate defining a step projecting into the aforesaid one of the aperture patterns closer to an outlet end than an inlet end, and causing the electron beam partially passing through the aforesaid one of the aperture patterns and partially transmitted through the step to be incident onto the target area (col. 2, lines 50-60). The apparatus includes a controlling sub-system comprises a deflecting unit 14a provided between the shaping lens units and 13b, an orthogonal driving mechanism associated with the second aperture plate, an orthogonal driving stage mounting the semiconductor wafer and a controlling unit for controlling the deflecting unit, the orthogonal driving mechanism and the orthogonal driving stage. The deflecting unit directs the electron beam to a target area of the second aperture plate, and cooperates with the orthogonal driving mechanism and the orthogonal driving stage so as to transfer a composite pattern image of an integrated circuit from the second aperture plate to the electron resist layer (col. 4, lines 15-25). Therefore, Nakajima teaches parameter settings for lithographic equipment are corrected on the XY differential based on a space dependency of the pattern.

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The references are analogous art as they are directed to proximity effect corrections. It would have been obvious to one of ordinary skill in the art to include the method of Nakajima in the method of Chen in order to control a profile of beam current density incident on a resist layer so that proximity effect can be controlled (col. 2, lines 40-50).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Saleha Mohamedulla whose telephone number is (703) 308-1260. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Mark Huff, can be reached on (703) 308-2464. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310. The After Final fax phone number is (703) 872-9311. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Saleha R. Mohamedulla
Patent Examiner
Technology Center 1700
October 30, 2003